Solutions for Demanding Applications

VarTech Systems Inc.

Industrial CRT and Flat Panel Displays

VT150 DiamondVue Series

15.0” Flat Panel Series LCD Monitors

VT150P · VT150P-SS · VT150PI

VT150R · VT150W · VT150M

Transflectives:

VT150PTSR · VT150PSSTSR

VT150RTSR · VT150WTSR · VT150MTSR

User’s Guide

Read these instructions completely before attempting to operate your new Color Display.

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Section

1

INTRODUCTION

About LCD Monitors

1.1 *What you gain by using an LCD monitor in your industrial controls*

LCDs are the future of display technology. Although CRTS have dropped in cost significantly, they do not offer the performance, reliability, and mounting options available with LCDs. LCD monitors consist primarily of an LCD, Video Board and a Back Light video. The LCD determines the function of the video board which converts the analog RGB (Red, Green, Blue) signals from a standard video card to a high quality, digital RGB that the LCD can display.

Recently the video card has taken on a new role. It is the responsibility of this device to "scale" a particular video resolution to the "native" resolution of the LCD. Simply, consider that a computer is putting out a VGA [640x480] resolution signal, yet the LCD that is connected is an XGA [1024x768] display. The displayed picture would be in the center 1/3 of the LCD. With the introduction of the scaling engine. The converter will mathematically recalculate the 640x480 to 1024x768. This may sound simple but it is in fact a complex algorithm that adjusts for different aspect ratios and pixel alignment, essentially smoothing text and graphics to produce a picture that is pleasant to the eye.

All Vartech displays from 12.1" (800x600) to 23.1 (1600x1200) incorporate scaling engines in the converter card.

1.2 Product Safety Precautions

- ⇒ Ensure that sufficient space is available around the display to provide the circulation necessary for cooling.
- ⇒ Ensure that the ambient air temperature will not exceed the specified maximum temperature.
- ⇒ Do not attempt to service this display yourself. The rear chassis has a seal so that non qualified personal will not expose themselves to dangerous voltages or other risks.
- ⇒ To protect from electrical shock, unplug the display power supply from the wall before moving.
- ⇒ Do not expose the display to direct sunlight or heat.
- ⇒ Do not use this display near water
- ⇒ Do not place any heavy objects on the power cords. Damage may cause electrical shock.
- ⇒ Unplug the power supply from the wall or unit if one of the following conditions exists.
    - ⇒ Power cord or plug is damaged or frayed
    - ⇒ Liquid is spilled into the display or the display is exposed to rain or water.
    - ⇒ The display does not operate normally when the operating instructions are followed.
    - ⇒ The display has been dropped or the enclosure has been damaged.
    - ⇒ The display exhibits a distinct change in performance, indicating a need for service.

Section

2

DISPLAY SETUP

2.1 VT150 Series Display Features

⇒ Capable of displaying unlimited colors in a continuous spectrum. The high contrast LCD enhances the image with no geometric distortion.

⇒ The VT150 DiamondVue Series directly accepts an analog 5 wire RGB with separate H/V sync or 4 wire RGB with separate combined sync or 3 wire SOG.

⇒ The VT150 DiamondVue Series is auto synchronous adjusting the display to the appropriate input between VGA, SVGA,XGA, and SXGA.

⇒ The VT150 DiamondVue Series is available in Panel Mount, Rack Mount, or Wall Mount industrial packages.

⇒ The VT150 DiamondVue Series is supplied with a Anti-Reflective Screen unless equipped with an optional Touch System.

⇒ The VT150 DiamondVue Series has an integrated 115/220VAC supply as standard on all models. Optional DC voltage available.

2.2 Unpacking and setting up your display

Your LCD monitor package will consist of the components listed below. Open shipping container and lay all components on a flat clean surface.

2.3 What is included with your display

- ⇒ VT150R, VT150P, VT150PSS, VT150M, VT150W, VT150PI LCD Monitor or VT150PTSR, VT150PSSTSR, VT150RTSR, VT150WTSR or VT150MTSR Transflective
- ⇒ 5 ft Video Cable
- ⇒ 10-32 Mounting Hardware. (For use with Panel Mount only)
- ⇒ 6 ft RS232 Touch Interface Cable (Optional when touch is installed)
- ⇒ CD ROM with Touch Screen Drivers (Optional when touch is installed)
- ⇒ Users Guide (Printed or on CD)

2.4 Connecting the Display

1. Connect all cables to the computer first. This would include the VGA cable and the optional RS 232 serial touch screen connection.
2. After connecting the cables between the LCD monitor and the computer, plug the customer supplied +12VDC source to the 12V connection on the rear.
3. Once the +12V connection is made, the display is active.
4. If your computer was off, turn on your computer.
5. Your display should now operate as a normal computer display showing your windows or whatever video is being sent to the flat panel.

Note: If for any reason the display goes blank and gives an “out of Range” or “No Input Signal”, your computer or video source is putting out a signal that is out of range of the LCD’s video board. If this happens, reboot the computer or video source and make sure you are inputting the correct signal. If the display doesn’t work properly, it may be because:

(a) The resolution is to high or low for the LCD.
(b) The refresh rate is set to high. Refresh on an LCD is different than a CRT. Set the refresh to 60Hz. CRT’s need a high refresh rate to avoid flicker. The refresh rate has no impact on LCD’s.
(c) The power source is incorrect.
(d) The unit is malfunctioning. If you believe this to be true, disconnect the video cable from the rear of the LCD and connect to a known good computer CRT display. If the computer display is working satisfactory and the video is within the appropriate range, then contact Vartech Customer service for a RMA number at 800-223-8050.

2.5 Signal Connections

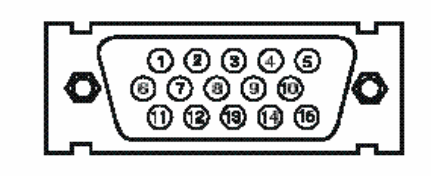
To avoid irregular operation and /or damage to the display, please insure correct video is being supplied as shown on the following page.

2.5 Signal Connections Cont.

You can use an HD-15 connector cable or a BNC adapter cable to connect the flat panel monitor to the host computer. The HD-15 video cable (supplied in the kit) you use with this monitor is equipped with a conventional HD-15 connector at each end.

Note: The following figure is the view looking into the pin end of the male connector or solder term end of the female connector.

HD-15 Video Connector
The following table provides the pin numbers and corresponding pin assignments for the HD-15 video connector.



Pin	Signal (HD15)	Pin	Signal (HD15)	Pin	Signal (HD15)
1	Red Video	6	Red Video Ground	11	Ground
2	Green Video	7	Green Video Ground	12	DDC Data
3	Blue Video	8	Blue Video Ground	13	Horizontal Sync
4	Ground	9	No Connection	14	Vertical Sync
5	Ground (DDC Return)	10	NGD-Sync / Self Test	15	DDC Clock

Composite Video Input Connector: CVBS 1.0V p-p
S-Video: S-VHS
LUMA Signal Input 0.7V p-p
CHROMA Signal Input 0.7V p-p

2.5 Signal Connections Cont.

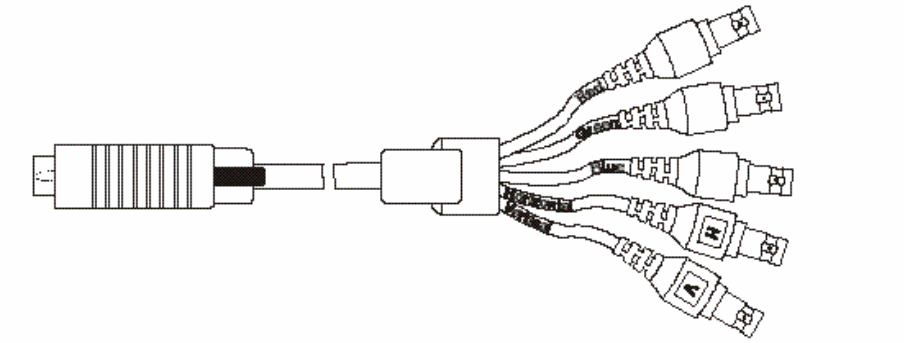
Optional BNC Adaptor Cable

A 5BNC-to-HD15 adapter cable is available. The functions of the cables are described below.

⇒ **R**, **B**, and **G**: Red, Green, and Blue input connectors to establish color. These are used for RS-343 analog signals.

⇒ **HS/CS**: Separate horizontal/composite sync signal from the video source.

⇒ **VS**: Separate vertical sync signal from the video source.



BNC Adapter Cable

This table describes the signal types you can use with the connectors:

BNC Signal Types						
BNC Signal Type	**Description**	**R**	**G**	**B**	**HS/ CS**	**VS**
Sync-on-Green (Not Available)	Use the three video connectors. Horizontal and vertical syncs are supplied on the green video line.	X	X	X		
Composite Sync (Not available)	Use the three video connectors plus the horizontal sync/ composite sync input	X	X	X	X	
Separate Horizontal and Vertical Sync.	Use the three video connectors plus the horizontal sync/ composite sync and vertical sync input.	X	X	X	X	X

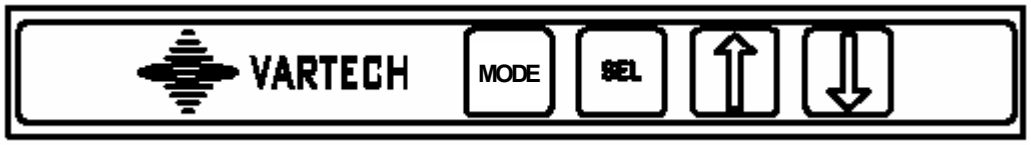
Section

3

GETTING STARTED

3.1 Adjusting the display

The VT150 DiamondVue Series display has an embedded microprocessor in the converter card. Once you have the unit displaying the resolution you desire for your application do the following:
In order to navigate to the appropriate adjustments, press **Menu** (or **MODE**) and the OSD layout chart will appear as indicated as shown below.



3.2 Definition of OSD (on screen display) Adjustments

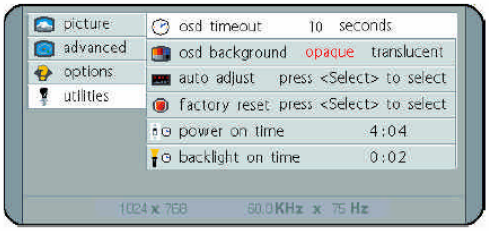
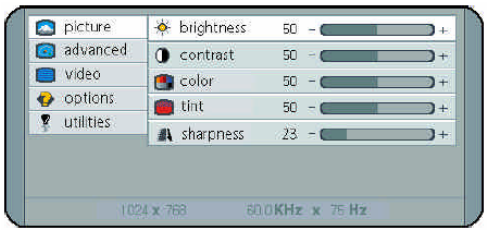
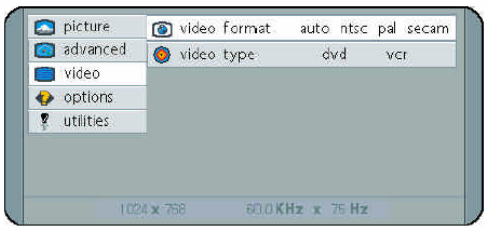
There are four membrane buttons located on the unit. They will activate the OSD and allow navigation to all adjustments if your unit requires adjustment.
Press **MENU** (or **MODE**) and a major adjustment category will appear. Press **DOWN** or **UP** and you will see the remaining adjustment categories. Press SEL to select a category or item for adjustment. The actual adjustment categories are listed under each major category (**bold**) as shown below.

CATEGORY	DESCRIPTION
PICTURE	Brightness, Contrast, Clock, Phase, H Position, V Position
ADVANCED	Color temp, User red, User green, User blue, Gamma
OPTION	OSD, OSD H pos, OSD V pos, Backlight
UTILITY	OSD Timeout, OSD background, auto adjust, factory reset, power on time, backlight on time
PICTURE	Brightness, Contrast, Color, Tint, Sharpness
VIDEO	Video format, Video type

3.3 Adjustment

OSD Agent		Description
Picture Used to fine tune and get the best image by removing noises that create unstable images with jitters and shimmers. 	**Brightness**	Adjusts the brightness of PC RGB's brightness.
	Contrast	Adjusts the contrast of PC RGB's contrast.
	Clock	Removes the noises. When frequency value is wrong, the image has horizontal lines especially in 1 dot on and off.
	Phase	Removes the noises. When phase value is wrong, the image has vertical lines especially in 1 dot on and off.
	H Position	Adjusts the horizontal position.
	V Position	Adjusts the vertical position.
OSD Agent		**Description**
Advanced Used to fine color and get the favorite color by selecting items, otherwise you can adjust each you want. 	**Color Temp**	Select Reddish color or Bluish
	User Red	Adjusts the color of Red.
	User Green	Adjusts the color of Green.
	User Blue	Adjusts the color of Blue
	Gamma	Adjusts the color characteristics
OSD Agent		**Description**
Option Used to move OSD window position. 	**OSD**	Moves the OSD Window quickly
	OSD H pos	Moves the OSD Window in the horizontal direction.
	OSD V pos	Moves the OSD Window in the vertical direction.
	Backlight	Adjusts the backlight.

3.3 Adjustment

OSD Agent		Description
Utility Used to adjust OSD Window characteristics. 	**OSD timeout**	Adjusts the OSD disappear time.
	OSD Background	Adjusts the OSD transparency.
	Auto Adjust	Function of executing auto adjustment.
	Factory Reset	Function of initializing setting value.
	Power on Time	Indicates active time on board.
	Backlight on Time	Indicates active time on backlight of panel.
OSD Agent		**Description**
Picture Used to fine tune and get the best image you want. 	**Brightness**	Adjusts the brightness of VIDEO / S-VHS RGB's.
	Contrast	Adjusts the contrast of VIDEO / S-VHS RGB's.
	Color	Adjusts the color of VIDEO / S-VHS RGB's.
	Tint	Adjusts the tint of VIDEO / S-VHS RGB's.
	Sharpness	Adjusts the sharpness of VIDEO / S-VHS RGB's.
OSD Agent		**Description**
Video Used to fine tune and get the best image by removing noises. 	**Video Format**	Select the video format.
	Video Type	Select the video player.

Section

4

TOUCH SCREEN

4.1 Introduction

Touch screens are a common means to interface operator inputs to a system. The universal standard of Windows GUI (Graphical User Interface) has significantly increased the use of touch screens.

There are four main touch technologies. The technologies are resistive, surface acoustic wave (SAW), capacitive, and infrared (IR). Each touch technology has advantages and disadvantages based on different user applications.

4.2 Installation

All Vartech Systems displays configured with a touch screen are supplied with a CDROM which includes user manuals, application software, and drivers for various operating systems. Insert the supplied CDROM into a CDROM drive and follow the installation instructions that will appear on the screen.

Limited technical support is available by contacting Vartech Systems customer support at 800-223-8050.

Section

5

TROUBLESHOOTING

Troubleshooting	
Trouble	**Troubleshooting Tip**
No Picture	⇒ The signal cable should be properly connected to the display card and computer. ⇒ Try disconnecting the video cable from the display and connecting to a CRT display if available to confirm the presence of proper video. ⇒ Make sure power is connected to the proper DC or AC source. ⇒ Make sure the resolution mode is supported by the display and check settings of the display card. ⇒ Confirm that the video cable is not defective.
Image Persistence	Image persistence occurs when a ghost of an image remains on the screen after the monitor has been turned off. Unlike a CRT monitor, an LCD monitor's image persistence is not permanent. To erase an image ghost, turn the monitor off for as long as the image was displayed. If the image was on for one hour and the ghost of the image remains, the display should be turned off for one hour to erase the image. To avoid this problem, use a screen saver.
Picture Quality & Image Stability	⇒ Check for proper video cable for proper grounding and shielding. ⇒ Check the signal source for proper signal. ⇒ Check for proper adjustment of the Phase and Frequency controls. ⇒ Check for proper recommended signal timing.
Green LED not lit	Check for proper power and power connections
Green LED blinking	This indicates absence of video or proper video for this display
Display image is not properly sized	⇒ Adjust the Vertical and Horizontal size controls via the OSD. (Reference setup adjustments) ⇒ Ensure that a supported mode is selected on the display card or system being used. Consult the display card or system manual for proper video.
No S-Video or NTSC operation	⇒ Check for proper connections. ⇒ Check the setup instructions for proper input selection.
If these tips do not solve your problem, contact Vartech Systems Customer Service support.	

Troubleshooting Cont.

Trouble	Troubleshooting Tip
Screen is blank.	Screen saver activated. Video Cable problem. Check for proper installation Change video cable . Faulty video display. Needs Service.
Image is dim, even with brightness and contrast controls set full UP	Video cable problem. Check for proper installation of cables Faulty video source. Faulty display.
Image not centered	Reset the horizontal and vertical positioning using the on-screen menu. Check to see if video source is operating within the monitor's range
Image will not adjust	Video timing outside of range. Use the on-screen menu to ad just the Clock Setting. Make sure timing is within VESA standard.
Image is not stable.	Monitor has incorrect or bad sync signals. Check for proper video cable installation. Replace suspected faulty cable. Check to ensure that video source is operating within the display's range.
Vertical shaded bars on Screen image	Horizontal size not properly adjusted. Adjust horizontal size settings
Colors are missing	Faulty video cable. Missing from video source. Connect video source to another display
Screen jitter or noisy display	Monitor clock phase not properly adjusted
Slight distortion in text or Graphics.	Not working in native resolution.
Display is present but "bars" Appear or roll across screen	Ground loop problem between computer and display Interference from adjacent equipment
The background looks Acceptable but text and Icons seem to be missing rows of pixels	Video running interlace mode.

Section

6

CLEANING AND MAINTANENCE

Cleaning
Occasionally clean the display panel and cabinet with a soft cloth dampened (not soaked) with a mild (non-abrasive) glass cleaner. Keep turning a fresh side of the cloth toward the screen surface to avoid scratching it with accumulated grit.

Note:
The solvent should be applied only to the cloth, and not directly on the monitor screen.

Do not use paper products as they may scratch the surface. To minimize the risk of abrasion, allow the screen to stand dry.
Special care should be taken when cleaning a touch screen or polycarbonate shield that is installed over the screen. Abrasive and certain chemical cleaners can easily damage the surface.
Never use alcoholic or ammoniac cleaners to clean the polycarbonate shield or a touch screen.

Note:
For best results cleaning a monitor with the optional antireflective tempered glass display shield, a solution of denatured alcohol is recommended to thoroughly clean the display.

Replacing a Line Cord
To avoid shock and fire hazards, the monitor's power cord should be replaced if the insulation becomes broken or if it develops a loose internal connection.

Other Maintenance
Qualified service personnel should perform all maintenance, except for the power cord replacement described above.

Section

7

MOUNTING INSTRUCTIONS

Mechanical Drawings		
Model	**Description**	**Page(s)**
VT150P	15.0” DiamondVue Panel Mount Mechanical Drawing	15-16
VT150R	15.0” DiamondVue Rack Mount Mechanical Drawing	17
VT150W	15.0” Wall Mount Mechanical Drawing	18
VT150PI	15.0” Intecolor Configured Mechanical Drawing	19-20

7.1 Panel Mount Procedure

Panel Mounting Procedure

1. Cut and drill the panel (refer to panel mount drawing). Measurements are in inches.

Panel Mounting Cutout

2. If access to the side of the monitor is not available following installation, attach the power and video cables to the side of the monitor at this time.
3. Install the monitor in the prepared cutout.
4. Install the lock nuts and washers, supplied with the monitor, behind the holes running along the sides and top/bottom of the cutout in the panel. Extra lock nuts and washers are provided.

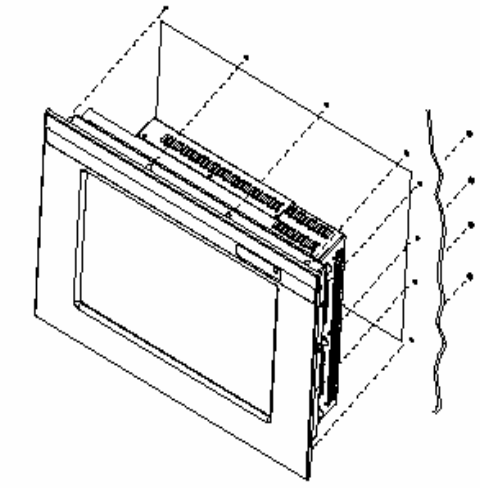
Note:
Use #10-32 nuts for mounting.

5. Tighten all mounting nuts evenly to a torque of 24 inch-pounds.

ATTENTION: Mounting nuts must be tightened to a torque of 24 inch-pounds to provide panel seal and avoid potential damage. Vartech Systems assumes no responsibility for water or chemical damage to the monitor or other equipment within the enclosure due to improper installation.

6. Attach the power and video cables to the side of the monitor if you have not already done so.

Generic Panel Mount Diagram



Section

8

SPECIFICATIONS

ENGINEERING SPECIFICATIONS	
Panel Size	15.0”
Type	TFT Active matrix w/ Anti-Glare coating
Resolution Capabilities	VGA to SXGA
Pixel Pitch	0.297mm
Active Display Area	150M / 150W: 11.97” x 8.95” / 304mm x 227mm 150PI / 150P / 150P-SS / 150R: 12.11” x 9.12” / 307.59mm x 231.65mm
Pixel Format	640 x 480, 800 x 600, 1024 x 768, 1280 x 1024
Viewing Angle (Left/Right)	70/70º
Viewing Angle (Up/Down)	65/70º
Contrast Ratio	300:1
Brightness	150P, 150R, 150PSS, 150W, 150M, 150PI: 450 Nits Transflectives: over 1000 Nits*
Response Time	T_R = 5ms typical T_F = 20ms typical
Back Lights	Cold Cathode 50,000 Hrs. Half Life
Video Connector	HD15(F); Composite Video (CVSC); S-Video (S-VHS)
Colors Supported	16.2M
Video Input	RGB Analog (0.7V p-p / 75ohm) , Digital NTSC / PAL, CVBS (1.0V p-p) S-VHS, luma/chroma (.7V p-p / 75ohm)
Sync	Separate H&V, Combined, SOG (Sync On Green), Digital
Input Voltage	AC 100-240V 50/60Hz 1.0A
Power consumption	Normal: 35Watts DPMS: < 5Watts
Operating Temperature	0 to 50ºC
Storage Temperature	-20 to 60ºC
Operating Humidity	10 to 95%NC
Storage Humidity	10 to 95%NC
Operating Altitude	Up to 10,000 ft
Storage Altitude	Up to 40,000 ft
*Outdoor Brightness Equivalent (Varies depending upon sunlight brightness)	

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